

DOCKET NO.: ISIS-5325

PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Charles Allerson, et al.

Application No.: 10/701,007

Filing Date: November 4, 2003

For: COMPOSITIONS COMPRISING ALTERNATING 2'-MODIFIED
NUCLEOSIDES FOR USE IN GENE MODULATION

Confirmation No.: Not Yet Assigned

Group Art Unit: Not Yet Assigned

Examiner: Not Yet Assigned

DATE OF DEPOSIT: *March 30, 2004*

I HEREBY CERTIFY THAT THIS PAPER IS BEING
DEPOSITED WITH THE UNITED STATES POSTAL
SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID,
ON THE DATE INDICATED ABOVE AND IS
ADDRESSED TO THE UNITED STATES PATENT AND
TRADEMARK OFFICE, P.O. BOX 1450, ALEXANDRIA,
VA 22313-1450.

Elizabeth A. McCloud

TYPED NAME: Elizabeth A. McCloud

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 CFR § 1.56 and in accordance with 37 CFR §§ 1.97-1.98, information relating to the above-identified application is hereby disclosed. Inclusion of information in this statement is not to be construed as an admission that this information is material as that term is defined in 37 CFR § 1.56(b).

- ☒ In accordance with § 1.97(b), since this Information Disclosure Statement is being filed either within three months of the filing date of the above-identified application, within three months of the date of entry into the national stage of

the above identified application as set forth in § 1.491, before the mailing date of a first Office Action on the merits of the above-identified application, or before the mailing date of a first Office Action after the filing of request for continued examination under § 1.114, no additional fee is required.

- ☐ In accordance with § 1.129(a), this Information Disclosure Statement is being filed in connection with ☐ the first or ☐ second After Final Submission, therefore:
- ☐ Certification in Accordance with § 1.97(e) is attached; or
- ☐ The fee of \$180.00 as set forth in § 1.17(p) is attached.
- ☐ In accordance with § 1.97(c), this Information Disclosure Statement is being filed after the period set forth in § 1.97(b) above but before the mailing date of either a Final Action under § 1.113 or a Notice of Allowance under § 1.311, or before an action that otherwise closes prosecution in the application, therefore:
- ☐ Certification in Accordance with § 1.97(e) is attached;
- or
- ☐ The fee of \$180.00 as set forth in § 1.17(p) is attached.
- ☐ In accordance with § 1.97(d), this Information Disclosure Statement is being filed after the mailing date of either a Final Action under § 1.113 or a Notice of Allowance under § 1.311 but before, or simultaneously with, the payment of the Issue Fee, therefore included are: Certification in Accordance with § 1.97(e); and the submission fee of \$180.00 as set forth in § 1.17(p).
- ☐ Copies of each of the references listed on the attached Form PTO-1449 are enclosed herewith.

- ☒ Copies of references listed on the attached Form PTO-1449 are enclosed herewith
- ☒ Copies of references listed on the attached Form PTO 1449 are not required to be submitted pursuant to the June 30, 2003 recent revisions to 37 CFR § 1.98(a)(2)(i).

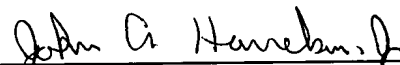
EXCEPT THAT:

- ☐ In view of the voluminous nature of references [list as appropriate], and the likelihood that these references are available to the Examiner, copies are not enclosed herewith.
- ☐ In accordance with § 1.98(d), copies of the following references listed on the attached Form PTO-1449 are not enclosed herewith because they were previously cited by or submitted to the U.S. Patent and Trademark Office in patent application(s) for which a claim for priority under 35 U.S.C. § 120 have been made in the instant application:
- ☐ Copies of references [list as appropriate] listed on the attached Form PTO-1449 were previously cited by or submitted to the Patent and Trademark Office in prior Application No. _____, filed _____.

Please charge any deficiency or credit any overpayment to Deposit Account No. 23-3050. This form is submitted in duplicate.

- ☐ The relevance of those listed references which are not in the English language is as follows:
- ☒ An English language abstract has been provided for reference 90 which is not in the English language.

Date: March 30, 2004



John A. Harrelson, Jr.
Registration No. 42,637

WOODCOCK WASHBURN LLP
One Liberty Place - 46th Floor
Philadelphia, PA 19103
Telephone: (215) 568-3100
Facsimile: (215) 568-3439

DOCKET NO.: ISIS-5325

PATENT



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In Re Application of:

Charles Allerson, et al.

Application No.: 10/701,007

Filing Date: November 4, 2003

For: COMPOSITIONS COMPRISING ALTERNATING 2'-MODIFIED
NUCLEOSIDES FOR USE IN GENE MODULATION

Confirmation No.: Not Yet Assigned

Group Art Unit: Not Yet Assigned

Examiner: Not Yet Assigned

DATE OF DEPOSIT: *March 30, 2004*

I HEREBY CERTIFY THAT THIS PAPER IS BEING
DEPOSITED WITH THE UNITED STATES POSTAL
SERVICE AS FIRST CLASS MAIL, POSTAGE PREPAID,
ON THE DATE INDICATED ABOVE AND IS
ADDRESSED TO THE UNITED STATES PATENT AND
TRADEMARK OFFICE, P.O. BOX 1450, ALEXANDRIA,
VA 22313-1450.

Elizabeth A. McCloud

TYPED NAME: Elizabeth A. McCloud

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT

Pursuant to 37 CFR § 1.56 and in accordance with 37 CFR §§ 1.97-1.98, information relating to the above-identified application is hereby disclosed. Inclusion of information in this statement is not to be construed as an admission that this information is material as that term is defined in 37 CFR § 1.56(b).

- ☒ In accordance with § 1.97(b), since this Information Disclosure Statement is being filed either within three months of the filing date of the above-identified application, within three months of the date of entry into the national stage of

the above identified application as set forth in § 1.491, before the mailing date of a first Office Action on the merits of the above-identified application, or before the mailing date of a first Office Action after the filing of request for continued examination under § 1.114, no additional fee is required.

- ☐ In accordance with § 1.129(a), this Information Disclosure Statement is being filed in connection with ☐ the first or ☐ second After Final Submission, therefore:
- ☐ Certification in Accordance with § 1.97(e) is attached; or
- ☐ The fee of \$180.00 as set forth in § 1.17(p) is attached.
- ☐ In accordance with § 1.97(c), this Information Disclosure Statement is being filed after the period set forth in § 1.97(b) above but before the mailing date of either a Final Action under § 1.113 or a Notice of Allowance under § 1.311, or before an action that otherwise closes prosecution in the application, therefore:
- ☐ Certification in Accordance with § 1.97(e) is attached;
- or
- ☐ The fee of \$180.00 as set forth in § 1.17(p) is attached.
- ☐ In accordance with § 1.97(d), this Information Disclosure Statement is being filed after the mailing date of either a Final Action under § 1.113 or a Notice of Allowance under § 1.311 but before, or simultaneously with, the payment of the Issue Fee, therefore included are: Certification in Accordance with § 1.97(e); and the submission fee of \$180.00 as set forth in § 1.17(p).
- ☐ Copies of each of the references listed on the attached Form PTO-1449 are enclosed herewith.

- ☒ Copies of references listed on the attached Form PTO-1449 are enclosed herewith
- ☒ Copies of references listed on the attached Form PTO 1449 are not required to be submitted pursuant to the June 30, 2003 recent revisions to 37 CFR § 1.98(a)(2)(i).

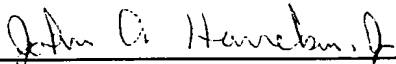
EXCEPT THAT:

- ☐ In view of the voluminous nature of references [list as appropriate], and the likelihood that these references are available to the Examiner, copies are not enclosed herewith.
- ☐ In accordance with § 1.98(d), copies of the following references listed on the attached Form PTO-1449 are not enclosed herewith because they were previously cited by or submitted to the U.S. Patent and Trademark Office in patent application(s) for which a claim for priority under 35 U.S.C. § 120 have been made in the instant application:
- ☐ Copies of references [list as appropriate] listed on the attached Form PTO-1449 were previously cited by or submitted to the Patent and Trademark Office in prior Application No. _____, filed _____.

Please charge any deficiency or credit any overpayment to Deposit Account No. 23-3050. This form is submitted in duplicate.

- ☐ The relevance of those listed references which are not in the English language is as follows:
- ☒ An English language abstract has been provided for reference 90 which is not in the English language.

Date: March 30, 2004



John A. Harrelson, Jr.
Registration No. 42,637

WOODCOCK WASHBURN LLP
One Liberty Place - 46th Floor
Philadelphia, PA 19103
Telephone: (215) 568-3100
Facsimile: (215) 568-3439



Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office		Docket No. ISIS-5325	Application No. 10/701,007
		Applicant Charles Allerson, et al.	
		Filing Date November 4, 2003	Group Not Yet Assigned
		Confirmation No. Not Yet Assigned	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)			
	3	Altmann, K.-H., et al., "Second-generation antisense oligonucleotides: structure-activity relationships and the design of improved signal-transduction inhibitors," <i>Biochem. Soc. Trans.</i> , 1996 , 24, 630-637	
	4	Altmann, K.-H., et al., "Second generation of antisense oligonucleotides: from nuclease resistance to biological efficacy in animals," <i>Chimia</i> , April 1996 , 50(4), 168-176	
	5	Altmann, K.-H., et al., "Second generation antisense oligonucleotides-inhibition of Pkc-1 and c-RAF kinase expression by chimeric oligonucleotides incorporating 6-substituted carbocyclic nucleosides and 2'-O-ethylene glycol substituted ribonucleosides," <i>Nucleosides & Nucleotides</i> , 1997 , 16(7-9), 917-926	
	6	Amarzguioui, M., et al., "Tolerance for mutations and chemical modifications in a siRNA," <i>Nucleic Acids Research</i> , 2003 , 31(2), 589-595	
	7	Baker, B.F., et al., "2'-O-(2-methoxy)ethyl-modified anti-intercellular adhesion molecule 1 (ICAM-1) oligonucleotides selectively increase the ICAM-1 mRNA level and inhibit formation of the ICAM-1 translation initiation complex in human umbilical vein endothelial cells," <i>J. Biol. Chem.</i> , 1997 , 11944-12000	
	8	Boutla, A., et al., "Short 5'-phosphorylated double-stranded RNAs induce RNA interference in <i>Drosophila</i> ," <i>Curr. Biol.</i> , 2001 , 11, 1776-1780	
	9	Braasch, D.A., et al., "RNA interference in mammalian cells by chemically-modified RNA," <i>Biochemistry</i> , 2003 , 42, 7967-7975	
	10	Brantl, S., "Antisense-RNA regulation and RNA interference," <i>Biochimica et Biophysica Acta</i> , 2002 , 1575, 15-25	
	11	Czauderna, F., et al., "Structural variations and stabilizing modifications of synthetic siRNAs in mammalian cells," <i>Nucleic Acids Research</i> , 2003 , 31(11), 2705-2716	
	12	Elbashir, S.M., et al., "Functional anatomy of siRNAs for mediating efficient RNAi in <i>Drosophila melanogaster</i> embryo lysate," <i>EMBO J.</i> , 2001 , 29(23), 6877-6888	
EXAMINER		DATE CONSIDERED	

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office	Docket No. ISIS-5325	Application No. 10/701,007
	Applicant Charles Allerson, et al.	
	Filing Date November 4, 2003	Group Not Yet Assigned
	Confirmation No. Not Yet Assigned	
OTHER DOCUMENTS (Including Author, Title, Date, Pertinent Pages, Etc.)		
	13	Fraser, A., et al., "Synthesis and conformational properties of 2'-deoxy-2'-methylthiopyrimidine and -purine nucleosides: potential antisense applications," <i>J. Heterocycl. Chem.</i> , 1993 , 30, 1277-1287
	14	Holen, T., et al., "Similar behaviour of single-strand and double-strand siRNAs suggests they act through a common RNAi pathway," <i>Nucleic Acids Res.</i> , 2003 , 31(9), 2401-2407
	15	Martin, "38. Ein neuer Zugang zu 2'-O-Alkylribonucleosiden und Eigenschaften deren Oligonucleotide", <i>Helv. Chim. Acta.</i> , (New access of 2'-O-alkylated ribonucleosides and properties of 2'-O-alkylated oligoribonucleotides) 1995 , 78, 486-504
	16	Martinez, J., et al., "Single-stranded antisense siRNAs guide target RNA cleavage in RNAi," <i>Cell</i> , September 6, 2002 , 110, 563-574
	17	Mellitzer, G., et al., "Spatial and temporal 'knock down' of gene expression by electroporation of double-stranded RNA and morpholinos into early postimplantation mouse embryos," <i>Mechanisms of Development</i> , 2002 , 118, 57-63
	18	Parrish, S., et al., "Functional anatomy of a dsRNA trigger: differential requirement for the two trigger strands in RNA interference," <i>Molecular Cell</i> , November 2000 , 6, 1077-1087
	19	Schwarz, D.S., et al., "Evidence that siRNAs function as guides, not primers, in the <i>Drosophila</i> and human RNAi pathways," <i>Molecular Cell</i> , September 2002 , 10, 537-548
	20	Chiu, Y.-L., et al., "siRNA function in RNAi: a chemical modification analysis," <i>RNA</i> , 2003 , 9, 1034-1048
EXAMINER		DATE CONSIDERED

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office				Docket No. ISIS-5325		Application No. 10/701,007	
				Applicant Charles Allerson, et al.			
				Filing Date November 4, 2003		Group Not Yet Assigned	
				Confirmation No. Not Yet Assigned			
U. S. PATENT DOCUMENTS							
Examiner Initial		Document No.	Date	Name	Class	Subclass	
	21	3,687,808	08/14/69	Merigan, Jr., et al.			
	22	4,981,957	01/01/91	Lebleu, et al.	536	27	
	23	5,013,830	05/07/91	Ohtsuka, et al.	536	27	
	24	5,034,506	07/23/91	Summerton, et al.	528	391	
	25	5,118,800	06/02/92	Smith, et al.	536	23	
	26	5,149,797	09/22/92	Pederson, et al.	536	27	
	27	5,166,315	11/24/92	Summerton, et al.	528	406	
	28	5,185,444	02/09/93	Summerton, et al.	544	81	
	29	5,214,134	05/25/93	Weis, et al.	536	25.3	
	30	5,216,141	06/01/93	Benner	536	27.13	
	31	5,220,007	06/15/93	Pederson, et al.	536	23.1	
	32	5,235,033	08/10/93	Summerton, et al.	528	391	
	33	5,256,775	10/26/93	Froehler	536	25.6	
	34	5,264,562	11/23/93	Matteucci	536	23.1	
	35	5,264,564	11/23/93	Matteucci	536	23.1	
	36	5,319,080	06/07/94	Leumann	536	27.1	
	37	5,359,044	10/25/94	Cook, et al.	536	23.1	
EXAMINER				DATE CONSIDERED			

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office				Docket No. ISIS-5325		Application No. 10/701,007	
				Applicant Charles Allerson, et al.			
				Filing Date November 4, 2003		Group Not Yet Assigned	
				Confirmation No. Not Yet Assigned			
U. S. PATENT DOCUMENTS							
Examiner Initial		Document No.	Date	Name	Class	Subclass	
	38	5,366,878	11/22/94	Pederson, et al.	435	91.3	
	39	5,393,878	02/28/95	Leumann	536	28.2	
	40	5,403,711	04/04/95	Walder, et al.	435	6	
	41	5,405,938	04/11/95	Summerton, et al.	528	406	
	42	5,434,257	07/18/95	Matteucci, et al.	536	24.3	
	43	5,446,137	08/29/95	Maag, et al.	536	23.1	
	44	5,466,677	11/14/95	Baxter, et al.	514	44	
	45	5,466,786	11/14/95	Buhr, et al.	536	26.26	
	46	5,470,967	11/28/95	Huie, et al.	536	24.3	
	47	5,489,677	02/06/96	Sanghvi, et al.	536	22.1	
	48	5,491,133	02/13/96	Walder, et al.	514	44	
	49	5,514,785	05/07/96	Van Ness, et al.	536	22.1	
	50	5,519,134	05/21/96	Acevedo, et al.	544	243	
	51	5,541,307	07/30/96	Cook, et al.	536	23.1	
	52	5,561,225	10/01/96	Maddry, et al.	536	23.1	
	53	5,565,350	10/15/96	Kmiec	435	172.3	
EXAMINER				DATE CONSIDERED			

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office				Docket No. ISIS-5325		Application No. 10/701,007	
				Applicant Charles Allerson, et al.			
				Filing Date November 4, 2003		Group Not Yet Assigned	
				Confirmation No. Not Yet Assigned			
U. S. PATENT DOCUMENTS							
Examiner Initial		Document No.	Date	Name	Class	Subclass	
	54	5,567,811	10/22/96	Misiura, et al.	536	25.34	
	55	5,576,427	11/19/96	Cook, et al.	536	23.1	
	56	5,591,722	01/07/97	Montgomery, et al.	514	45	
	57	5,596,086	01/21/97	Matteucci, et al.	536	22.1	
	58	5,597,909	01/28/97	Urdea, et al.	536	24.3	
	59	5,602,240	02/11/97	De Mesmaeker, et al.	536	22.1	
	60	5,608,046	03/04/97	Cook, et al.	536	23.1	
	61	5,610,289	03/11/97	Cook, et al.	536	25.34	
	62	5,610,300	03/11/97	Altmann, et al.	544	229	
	63	5,618,704	04/08/97	Sanghvi, et al.	435	91.5	
	64	5,623,065	04/22/97	Cook, et al.	536	23.1	
	65	5,623,070	04/22/97	Cook, et al.	536	27.6	
	66	5,627,053	05/06/97	Usman, et al.	435	91.1	
	67	5,633,312	05/27/97	Kabeta, et al.	528	14	
	68	5,633,360	05/27/97	Bischofberger, et al.	536	22.1	
	69	5,639,873	06/17/97	Barascut, et al.	536	25.3	
	70	5,646,265	07/08/97	McGee	536	25.34	
EXAMINER				DATE CONSIDERED			

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office				Docket No. ISIS-5325		Application No. 10/701,007	
				Applicant Charles Allerson, et al.			
				Filing Date November 4, 2003		Group Not Yet Assigned	
				Confirmation No. Not Yet Assigned			
U. S. PATENT DOCUMENTS							
Examiner Initial		Document No.	Date	Name	Class	Subclass	
	71	5,646,269	07/08/97	Matteucci, et al.	536	26.7	
	72	5,652,355	07/29/97	Metlev, et al.	536	24.5	
	73	5,652,356	07/29/97	Agrawal	536	245	
	74	5,658,873	08/19/97	Bertsch-Frank, et al.	510	375	
	75	5,663,312	09/02/97	Chaturvedula	536	22.1	
	76	5,670,633	09/23/97	Cook, et al.	536	23.1	
	77	5,677,437	10/14/97	Teng, et al.	536	23.1	
	78	5,677,439	10/14/97	Weis, et al.	536	23.1	
	79	5,700,920	12/23/97	Altmann, et al.	536	221	
	80	5,700,922	12/23/97	Cook	536	23.1	
	81	5,792,608	08/11/98	Swaminathan, et al.	435	6	
	82	5,792,747	08/11/98	Schally, et al.	514	12	
	83	5,898,031	04/27/99	Crooke	435	172.3	
	84	6,107,094	08/22/00	Crooke	435	455	
	85	6,172,209 B1	01/09/01	Manoharan, et al.	536	23.1	
	86	6,271,358 B1	08/07/01	Manoharan, et al.	536	23.1	
EXAMINER				DATE CONSIDERED			

Form PTO-1449 Modified List of Patent and Publications Cited by Applicant (Use several sheets if necessary) U.S. Department of Commerce Patent and Trademark Office				Docket No. ISIS-5325		Application No. 10/701,007	
				Applicant Charles Allerson, et al.			
				Filing Date November 4, 2003		Group Not Yet Assigned	
				Confirmation No. Not Yet Assigned			
FOREIGN PATENT DOCUMENTS							
Examiner Initial		Document No.	Date	Country	Translation		
					YES	NO	
	87	WO 89/12060	12/14/89	PCT			
	88	WO 99/32619	07/01/99	PCT			
	89	WO 00/08044	02/17/00	PCT			
	90	WO 00/44895	08/03/00	PCT	X abstract		
	91	WO 00/44914	08/03/00	PCT			
	92	WO 00/49035	08/24/00	PCT			
	93	WO 00/63364	10/26/00	PCT			
	94	WO 01/29058	04/26/01	PCT			
	95	WO 01/36641 A2	05/25/01	PCT			
	96	WO 01/36646 A2	05/25/01	PCT			
	97	WO 01/075164 A3	10/11/01	PCT			
EXAMINER				DATE CONSIDERED			